Clustering The Consumers According To Their Environmental Concern: A Study In The Turkish Market

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ABSTRACT

The consumption of natural resources and environmental pollution is still one of our planet's most serious problems. Accordingly, the number of consumers who are worried about diminishing natural resources is increasing rapidly. Knowing more about these consumers will give companies the opportunity to define their strategies appropriately. The objective of this study is to profile consumers regarding environmental concern and green buying behavior. Three distinct clusters are identified and they are labelled as "highly environmentally-concerned seniors", "least environmentally-concerned youngsters," and "moderately environmentally-concerned middle aged." The study is significant because it offers insights for marketers and academicians who are interested in green marketing.

Keywords: Environmental Concern; Green Buying Behavior; Cluster Analysis

1. INTRODUCTION

The first wave of modern environmentalism in the 1960s and 1970s was triggered by environmentalist groups and concerned consumers. The second wave in the 1970s and 1980s was due to government legislation and the regulation of industrial practices that affect the environment. The first two waves of environmentalism merged and led to the third, more powerful wave of our day. This wave represents a period when companies are accepting the responsibility to do *no harm* to the environment (Kotler and Armstrong, 2010). Today, both institutions and individuals are aware of limited natural resources of the planet. Green consumption behavior and the factors influencing it, play an important role on the sustainability of planet and the economies.

2. THEORETICAL FRAMEWORK

The American Marketing Association organized its first meeting on "Ecological Marketing" in 1975, and one of the first books on green marketing, also entitled *Ecological Marketing*, was published by Henion and Kinnear in 1976 (Paco and Raposo, 2008). Environmental concern has been treated as "an evaluation of, or an attitude towards facts, one's own behavior, or others' behavior with consequences for the environment" (Fransson and Gaerling, 1999). An environmentally concerned consumer is likely to be either younger or mature and more educated (Aaker & Bagozzi, 1982; Anderson & Cunningham, 1972; Leonard-Barton, 1981; Murphy et al., 1978; Samdahl & Robertson, 1989; Van Liere & Dunlap, 1980). It has also been suggested that younger, more educated individuals with liberal political ideologies living in urban areas are the most environmentally concerned (Gardner and Stern, 1996).

Concern about environmental degradation led to a new consumer segment named "green consumers" in many markets. Green consumers avoid products that are unhealthy and harming the environment during production, use or disposal and likely causing unnecessary waste which threatens the environment or living beings (Paco and Raposo, 2008).

Many models that seek to explain environmentally friendly behavior can be found in the literature. These models are "the model of ecological behavior" (Fietkau and Kessel, 1981), "obstacles between environmental concern and mobilization" (Blake, 1999) and "the model of environmental behavior" (Kollmuss and Agyeman, 2002). The model of environmental behavior includes internal and external factors and obstacles that affect environmental behavior. Internal factors include personality traits, value systems and environmental awareness. External factors are political, social, cultural and economic factors. Some of the obstacles for environmentally friendly behavior are; old behavioral patterns, lacking environmental awareness, lack or weakness of feedback about the behavior and lack of inner motivation. In studies conducted in Turkey, Cabuk et al. (2008) found that female, married, young, highly educated and high income individuals display more green buying behavior, while Sener and Hazer (2008) found that in terms of sustainable consumer behavior, environmental behavior towards saving resources like not using the washing machine unless it's full or switching electronic devices off when they are not being used, are given more importance than behaviors directly addressing the protection of the environment like separating recyclable wastes, considering the environmental impact of buying shampoo and other products.

3. METHOD

The aim of this study is to understand the characteristics of the respondents regarding environmental concern and to explore their green buying behavior. A pre-test was conducted with fifty respondents. After the pre-test, using convenience sampling 440 responses were collected from an on-line survey of Istanbulites. After eliminating incorrect and incomplete samples, 377 surveys remained for analysis. Respondents answered items using a 5-point scale. The demographic characteristics were measured using nominal scale. The data were statistically analyzed and interpreted using SPSS 19.0. The measures for environmental concern and green buying behavior were adapted from Lee (2008). Both measures were accepted as reliable due to high Cronbach's Alpha values (0.821 for environmental concern and 0.807 for green buying behavior).

4. FINDINGS

The demographic profile of the respondent group is presented in Table 1 below. It was found that 55.35% of the respondents were female. In terms of age distribution, 68.71% were between 18-35 years of age, and only 8.02% were over 50 years old. Of the participants, 64.01% were single, 47.25% have bachelor degrees, and 14.29% had graduate degrees. Regarding the economic status, 33.43% had monthly income of 5.000 TL or more and 27.48% had monthly income between 3.000TL and 5.000 TL. Finally, 86.56% were following environmental news in the media, and 13.03% were members of an environmental organization. These statistics indicate that the participants were well above the Turkish averages in terms of education, income level and membership in environmental organizations.

Table 1: Demographic Profile

Age	**N**	**%**	**Monthly income**	**N**	**%**
18-25	151	40.37	<500TL	4	1.13
26-35	106	28.34	500TL-1000TL	14	3.97
36-49	87	23.3	1000TL-3000TL	120	33.99
>50	30	8.0	3000TL-5000TL	97	27.48
Gender			>5000TL	118	33.43
Female	207	55.3	**Environmental news follow-up**		
Male	167	44.7	Yes	322	13.44
Education level			No	50	86.56
Graduate degree	52	14.29	**Membership in an environmental organisation**		
Bachelor	172	47.25	Yes	49	13.03
High school	132	36.26	No	327	86.96
Lower degree	8	2.20			
Marital status					
Single	233	64.01			
Married	131	35.99			

The results of the hierarchical cluster analysis indicated that two, three or four clusters were appropriate for the study. K-means clustering showed that a three-cluster solution offered the best statistical results. According to ANOVA results in Table 2, environmental concern questions significantly clustered the respondents in three different clusters ($p<0.05$). It is found that the highest environmental concern scores belong to Cluster 1 and the lowest scores belong to Cluster 2. Except gender and income, all socio-demographic variables were significantly different for three clusters as seen in Table 3. So, the clusters are labeled "*highly concerned seniors*," "*the least concerned youngsters*" and "*moderately concerned middle aged.*"

Table 2: Environmental Concern Mean Scores For Clusters

	Cluster 1	**Cluster 2**	**Cluster 3**	**F Ratio**	**Significance level**
Variables	***(n=159)***	***(n=58)***	***(n=160)***		
I am worried about the worsening of the quality of my city's environment.	4.75	2.69	4.24	214.27	.000
My city's environment is my major concern.	4.76	2.71	4.14	239.01	.000
I am emotionally involved in environmental protection issues in my city.	4.31	2.03	3.03	257.05	.000
I often think about how the environmental quality in my city can be improved.	4.18	2.01	2.87	233.54	.000
Note: Respondents were asked to indicate their answers on a scale ranging from 1 = never 2 = rarely, 3 = sometimes, 4=often and 5 = always.					

Table 3: Cluster Profiles

	Cluster 1	**Cluster 2**	**Cluster 3**	**Statistics**
Marital Status				x2=14.96
Single	53%	74%	72%	df=2
Married	47%	26%	28%	p<0.005
Age				x2=45.692
18-25	23%	64%	49%	df=8
26-35	35%	14%	27%	p<0.005
36-49	29%	22%	18%	
>50	13%	0%	6%	
Education				x2=13.40
Graduate	16%	10%	14%	df=6
Bachelor	53%	33%	47%	p<0.005
High School	30%	52%	37%	
Lower degree	1%	5%	2%	
Environmental news follow-up				x2=60.94
Yes	94%	54%	90%	df=2
No	6%	46%	10%	p<0.005
Membership in an environmental organization				x2=17.79
Yes	21%	3%	8%	df=2
No	79%	97%	92%	p<0.005

Cluster 1 (n=159) "highly concerned seniors": The members of this cluster show the highest environmental concern. They are the eldest, with 42% over age of 36. They have the highest education level, with 69% having bachelor's or graduate degrees. The highest marriage (47%), environmental news follow-up (94%) and environmental organization membership (21%) rates belong to this cluster.

Cluster 2 (n=58) "the least concerned youngsters": The members of this cluster show the least environmental concern. They are the youngest group with 78% between the ages of 18 and 35. They have the lowest education level, with 57% of them having high school and secondary school diplomas. The highest single rate (74%), the lowest environmental news follow-up rate (54%) and the lowest environmental organization membership rate (3%) belongs to this cluster.

Cluster 3 (n=160) "the moderately concerned middle-aged": The members of this cluster show a moderate level of environmental concern. They have high education level, with 61% having attained bachelor and graduate degrees. Of Cluster 3, 72% are single, 90% follow environmental news and 8% are members of an environmental organization.

After the optimum number of clusters was determined, discriminant analysis was used to determine whether there were any distinctive differences between the groups. Table 4 summarizes the results of the discriminant analysis.

Table 4: Discriminant Analysis Results

Function	Eigenvalue	% Variance	Canonical Correlation	Wilks' Lambda	Chi-square	Sig.
1	4.48	96.8	0.91	0.16	685	0.000
2	0.15	3.2	0.36	0.87	51.37	0.000

Environmental concern items contribute to meaningful discrimination between clusters and discriminant analysis shows that participants are divided into three clusters that differ by their levels of environmental concern. Finally, ANOVA was used to explore whether the clusters differ in terms of green buying behavior. It was found that $F(2, 374)=34.7$; $p< .05$, green buying behavior differs across the three clusters. Furthermore, post hoc tests show that the group mean differences are statistically significant. The mean scores for green buying behavior are Cluster 1=4.05, Cluster 2=3.05 and Cluster 3=3.69. The findings show that the highly concerned consumers' green buying behavior is the highest, whereas the least concerned youngsters' green buying behavior is the lowest.

5. CONCLUSION

The highly concerned seniors are highly educated and married. They follow news on environmental issues closely and have the highest rates of, environmental organization membership and green buying behavior. They are already familiar with buying green products. To increase their green consumption, green marketers may offer this segment a marketing mix that creates value for family and children concerning the health and sustainability of the planet. Since many of them are members of environmental organizations, their activism may spread this green spirit to their social groups. So, this group may be further researched focusing on their opinion leader characteristics.

The least concerned youngsters follow environmental news closely; however, their green buying behavior is very low. Marketers targeting this segment should use a product mix that will be effective on Generation Y. This segment is the least educated with the highest rate of unmarried people. Marketing experts targeting this group are advised to use more humor, fun and creative elements in their marketing communication. As this segment is least emotional about environmental protection, it seems that healthy living will not motivate them to buy green. In order to stimulate them, realistic facts concerning green products should be used. In this study it is also found that education, age and marital status are critical factors in environmental concern and green buying behavior. According to the findings of the clustering analysis, the marketing managers are recommended to consider the psychological, behavioral and socio-demographical differences between the different segments when designing and applying marketing strategies and marketing programs for each segment. On the other hand, governments' efforts concerning environmental sustainability will force brands to take sustainability into consideration and the consumers to be more demanding for green products. Although it is not the same level as in developed economies, green buying behavior has become an important part of marketing strategies in Turkey. So, it is expected that this study will provide an insight to the brands targeting the profile studied in this research. For further research, it is recommended to analyze the psychological factors that determine green behavior for all segments of the population.

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